



Join in Marshall's Family Fun Day Aug. 25

Marshall's Family Fun Day from 10 a.m.-3 p.m. Aug. 25 at the picnic pavilion promises to be the best-ever with the food, games, prizes and fun stepped up a notch.

Don't miss the carnival atmosphere, midway games, live music featuring Gryphon, Abstract and Latin Rhythms, and exhibits — Starship

2040, Marshall's Botanical Butterfly, cars, motorcycles, airplanes and artwork.

Door prizes will be selected hourly, and you must be present to win.

Meal tickets — at \$6 each for either a barbecue plate, chicken or a garden burger — are on sale through Friday from admin officers.



MARSHALL STAR

Marshall Space Flight Center

Aug. 16, 2001

Marshall contributes experiments, EXPRESS racks, supplies and new POC crew to support STS-105



NASA Photo

Cosmonaut Vladimir N. Dezhurov, Expedition Three flight engineer, trains for the first long-term study of lung function in space.

by Tracy McMahan

New science investigations, a fresh ground crew to operate experiments, two more science racks, and delivery of Leonardo — the logistics module carrying experiments to the International Space Station — are all contributions of the Marshall Center to the current Space Station expedition.

Last Friday's launch of Space Shuttle Discovery on the STS-105 mission marked the beginning of the newest four-month science expedition — Expedition Three — continuing through the landing of the Space Shuttle Endeavour on STS-108 mission in early December. Discovery is delivering more scientific experiments and a new three-member crew to the Space Station, and will return to Earth with scientific equipment, samples and data, as well as the three Expedition Two crew members.

See *Discovery* on page 4

NASA scientists to brave storms in quest for better prediction methods

by Sherrie Super

As this year's hurricane season rolls in, a team of researchers participating in a NASA study is waiting. Armed with airplanes, robotic aerial vehicles and a fleet of sophisticated instruments, they're ready to meet these potentially deadly and destructive storms head-on, gathering data vital to improve hurricane prediction.

They're part of the Convection And Moisture EXperiment (CAMEX) — the fourth in a series of field research

investigations sponsored by the Atmospheric Dynamics and Remote Sensing Program at NASA Headquarters in Washington, D.C. It unites researchers from 10 universities, five NASA centers and the National Oceanic and Atmospheric Administration (NOAA).

Based out of the Naval Air Station at Jacksonville, Fla., this year's mission will be conducted from Aug. 16 through Sept. 24 — traditionally the most active part of

See *Prediction* on page 3

Inside the Star

- **Marshall's Optics center makes mold for high-resolution screens, page 2**
- **Marshall contractor one of 12 selected for Stokes Fellowship, page 6**
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It's not a giant penny

Space optics center at Marshall makes king-size mold for high-resolution screens

Marshall release

It's not a giant penny. This king-size copper disk, manufactured at the Space Optics Manufacturing and Technology Center at the Marshall Center, is a special mold for making high-resolution monitor screens.

Wes Brown, Marshall's lead diamond turner — an expert in the science of using diamond-tipped tools to cut metal — uses a magnifying glass to inspect the mold's physical characteristics to ensure the uniformity of its more than 6,000 grooves.

This master mold will be used to make several other molds, each capable of forming hundreds of screens that have a type of lens called a fresnel. Weighing much less than conventional optics, fresnel lenses have multiple concentric grooves, each formed to a precise angle, that together create the curvature needed to focus and project images.

Marshall is a technology leader for diamond turning. The machine used to manufacture this mold is among many one-of-a-kind pieces of equipment at Marshall's Space Optics Manufacturing and Technology Center.



Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Marshall's Wes Brown inspects the thousands of grooves in this special mold.

Does the Marshall Center have Star quality?

from Marshall's Safety Office

OSHA's Voluntary Protection Program (VPP) offers two qualification levels, Merit and Star, as described below. Each applicant's Safety and Health Program is evaluated to determine whether it qualifies for one of these levels, or is not sufficiently developed to participate in VPP. Will the Marshall team have enough Star quality to play a leading role in worker protection?

Merit

- For employers who demonstrate the potential and willingness to achieve Star requirements.
- For worksites that don't quite meet eligibility requirements for the Star Program.
- OSHA provides a planned set of "stepping stones" to Star certification.

Star

- OSHA's most highly selective program.
- For comprehensive safety and health programs that effectively reduce workplace hazards.
- For worksites where Safety, Health and Environmental

programs are an integral part of daily operations.

- For programs that comply with all mandatory requirements of the Occupational Safety and Health Act and OSHA standards.
- For employers on the leading edge of hazard prevention methods and technology.
- For organizations that show continuous improvement in their safety and health programs.

Shooting for the Star

- Marshall management is dedicated to worker protection.
- Marshall's Safety, Health and Environmental Program has been continually improving over the past two years.
- Current improvement efforts are focused on identification and control of job hazards, state-of-the-art training, and assurance of full OSHA compliance.
- Must develop innovative processes and creative strategies for implementation, providing each worker with maximum protection with minimum impact on missions and projects.
- Just as we excel in science, research, and development, we belong on the leading edge of worker protection.
- Pooling resources, sharing expertise, and teamwork will propel our Marshall community to the Stars.



Marshall photo

History chat

Former Lunar Roving Vehicle (LRV) Project Manager Sonny Morea talks about the development of the vehicle during a history chat at the Heritage Gallery July 27. Morea's visit was in conjunction with the 30th anniversary of the first use of the LRV. The history chat series is sponsored by Marshall's History Office and highlights key events from Marshall's history.

Prediction

Continued from page 1

the hurricane season. During CAMEX, researchers will gather storm and atmospheric data from multiple sources, including piloted aircraft, uninhabited aerial vehicles, satellite observations, weather balloons, ground-based radar, and other ground-based sensing instruments.

Temperature, pressure, humidity, precipitation, wind speed, lightning and ice crystal sizes are examples of the kinds of information that will be collected. These data are expected to provide additional insight to hurricane researchers and forecasters who continually strive to improve hurricane predictions.

"One reason NASA studies hurricanes is to understand the best way to use information from NASA resources, such as its satellites, to provide better warnings to the American public and people around the world affected by hurricanes," said Robbie Hood, CAMEX lead mission scientist at the Global Hydrology and Climate Center, based at the National Space Science and Technology Center in Huntsville.

"During the last CAMEX experiment in 1998, we flew over hurricanes and collected a vast amount of data, sampling the hurricanes' upper regions at altitudes of 35,000 feet (10,600 meters) or higher," said Hood. "This year, we're asking ourselves additional questions, such as, 'What are the most important forces that cause a hurricane to intensify?' and 'What is its rainfall potential after it comes to shore?' The highest number of hurricane-related deaths are due to inland flooding, so rainfall potential is a very important issue."

The CAMEX team of scientists and crew plans to fly into the season's hurricanes aboard two NASA planes, the ER-2 and DC-8, both from NASA's Dryden Flight Research Center, Edwards, Calif. Carrying a series of instruments, these aircraft will fly over, through and around selected hurricanes as they approach landfall in the Caribbean, Gulf of Mexico and along the East Coast of the United States.

The DC-8, equipped with instruments to measure the storms' structure and environment, will fly into the storm at 35,000 to 40,000 feet (12,200 meters). At the same time, the specially equipped ER-2, a high-altitude research plane, will soar above the storm at 65,000 feet (19,800 meters).

NASA also is funding the flight of several uncrewed aerial vehicles called the Aerosonde Robotic Aircraft, managed in conjunction with the University of Colorado at Boulder. A small, robotic aircraft designed for collection of meteorological data over oceans and remote areas, the Aerosondes will operate over the Atlantic Ocean taking observations in the lower atmosphere.

In the first use of uncrewed aircraft during the study of Atlantic hurricanes, the Aerosondes will fly low over the ocean surface collecting data on atmospheric temperature, pressure, relative humidity and winds for periods up to 24 hours at a time. Although investigating hurricanes is the primary objective of CAMEX-4, separate flights will study thunderstorm structure, precipitation systems and atmospheric water vapor profiles.

This portion of CAMEX-4 is known as Keys Area Microphysics Project (KAMP). The project seeks improved precipitation estimates from passive and active microwave instruments — equipment that detects precipitation by measuring natural microwave emissions from cloud water, cloud ice and rainfall. Flights for the microphysics project will be approximately 300 nautical miles (560 km.) from the air station near Key West, Fla.

The third Convection and Moisture Experiment (CAMEX-3) was based at Patrick Air Force Base, Fla., south of Cape Canaveral. The first two CAMEX field studies were conducted at Wallops Island, Va., during 1993 and 1995.

The hurricane study is part of NASA's Earth Science Enterprise to better understand the total Earth system and the effects of natural and human-induced changes on the global environment.

The writer, employed by ASRI, supports the Media Relations Department.

Discovery

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“We will focus more on the research program,” said John Uri, lead increment scientist for Expedition Three at Johnson Space Center in Houston, Texas. “We are on our way to building and maintaining a world-class science research laboratory in low-Earth orbit.”

To conduct 18 U.S. experiments during Expedition Three, Uri’s team will work closely with the Payload Operations Center — NASA’s command post for Space Station science activities at the Marshall Center. A new cadre of controllers replaced their Expedition Two colleagues and started working on Aug. 6 in three shifts, around-the-clock, seven days a week. Their mission is to link Earth-bound researchers with experiments and astronauts aboard the Space Station.

“Science is happening on the station 24-hours a day — even when the crew is sleeping,” said Ray Echols, the lead payload operations director who heads the cadre working in the science control center at Marshall. “Allocation of a small amount of the crew’s time to set up and install experiments can yield a lot of science. Once many experiments are started, we can control them remotely from the ground.”

Via communications and computer equipment at the Payload Operations Center, Echols and his team can send commands to experiments or enable investigators around the world to command their experiments remotely or talk to the Space Station crew.

“The Expedition Two crew has blazed the trail for Expedition Three by taking the first set of payloads and operating them on the Station,” said Echols.

During Expedition Two, 18 experiments were operated, and more than 15,000 commands were sent to experiment payloads and support equipment on the Station. On March 9, a Canadian principal investigator made the first call to the Station crew about his experiment. On May 1, experimenters working at a Colorado “telescience” center were the first to send commands remotely to a Station experiment.

Investigators on the ground and the team in the operations center, staffed by members of Marshall’s Flight Projects Directorate, act almost like a “fourth Station crew member” by operating experiments remotely and receiving data from the experiments in space.

Engineers from Marshall’s Flight Projects Directorate also managed the development of the Italian-built Leonardo multi-purpose logistics module. On its second trip to the Station, this “space moving van” was ferried to the Station inside Discovery’s payload bay. Riding inside Leonardo are two new experiment racks, called EXpedite the PROcessing of Research Experiments on Space Station or EXPRESS racks, built and tested by The Boeing Company at Marshall’s Space Station Manufacturing Building. These racks transport and support experiments, providing power, fluids, gases, cooling and data-storage and transmissions computers.



The Dynamically Controlled Protein Crystal Growth Experiment is one of the Marshall experiments on one of the EXPRESS Racks being delivered to the Space Station.

The addition of EXPRESS Racks 4 and 5 will bring the total research racks inside the Destiny laboratory module to five. EXPRESS Racks 1 and 2 and the Human Research Facility were delivered, activated and checked out during Expedition Two. (EXPRESS Rack 3 will be delivered on a future expedition.) These racks will continue to support existing and new experiments.

“We are doing science in all the disciplines, and the science is becoming more complex with every new expedition,” said Uri. “With Expedition Three, we are pleased to bring a number of new scientists to the Space Station team, and look forward to continuing work with those who already have experiments on our newest orbital research facility.”

Eight new experiments will get under way in the five research facilities, and 10 experiments — started on Expedition One or Two — will continue.

“One of the advantages of Space Station research is the flexibility to continue long-duration research over several expeditions, modifying research procedures and parameters to take advantage of intriguing results,” said Uri. “We want science on the Station to be as much like science in an Earth-based laboratory as possible, but of course without gravity.”

The first experiment to be mounted outside the Station — the Materials International Space Station Experiment (MISSE) — will be delivered by the STS-105 crew and mounted outside the Station during an Extravehicular Activity, or space walk. MISSE will test the durability of hundreds of samples, ranging from lubricants to solar cell technologies.

See Discovery on page 5

New online tool to streamline training needs process

From Aug. 27-Sept. 7, Marshall's Employee and Organizational Development Department will debut a new online tool designed to streamline the annual training needs assessment process.

A series of overview programs has been scheduled to introduce the new tool to the Center. Sessions will be from 1:30-2:30 p.m. Aug. 22, 23 and 24 in Bldg. 4200, room G13A. Organizations may also request an overview presentation at their site.

"The assessment tool represents a significant improvement in the way we collect projected training requirements," said John Heath, Employee and Organizational Development specialist. "The tool has been designed to be simple, flexible and provide organizations with a variety of comprehensive reports to help them better plan and prioritize their develop-



Training & Organizational Development Needs Assessment

Welcome to the Marshall Space Flight Center Training & Organizational Development Needs Assessment Tool. This instrument plays a key role in determining what training & organizational development opportunities will be available at the center in the coming fiscal year. Your input is valued. For questions concerning this tool please contact John Heath at 544-2622 or via e-mail at John.Heath@msfc.nasa.gov.

Input Training Requirements:		Other Options:	
by Employee	Option 1: Select an employee, then identify their training requirements.	On Line Help	View On-Line Help
by Course	Option 2: Select a training course, then identify which employee(s) need it.	View Inputs	View requirements identified for your organization.
by Group	Option 3: Identify training programs with 15 or more attendees from your organization. (examples: ISO, computer security, ethics, safety)	Off Sites	Identify offsite events, organizational development programs or other special organization requirements.

Owner: [John Heath](#)
Curator: [Alisa Davis](#)
[NASA Privacy Statement](#)
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mental activities in the coming year.

"Historically organizations have placed the data collection burden on one or two people," said Heath. "The new tool gives organizations the option of allowing all

users to directly participate in the process, giving individuals greater influence over training programs that will be offered."

For more information on the training assessment tool or process, call 544-2622.

Discovery

Continued from page 4

By examining how coatings fare in the harsh environment of space, scientists can learn how to develop materials for future spacecraft and make materials last longer on Earth. Rachel Kamenetzky is the MISSE principal investigator at the Marshall Center, and the experiment is managed by Langley Research Center in Hampton, Va., and is a collaborative effort among NASA centers, the U.S. Air Force and private industry.

The first experiments with biological cell cultures also begin on the Station in Expedition Three, with delivery of a major facility: the Cellular Biotechnology Operations Support System (CBOSS).

"This will be our first opportunity to use a sophisticated bioreactor to grow cells in low gravity created as the Station orbits Earth," said Uri. "Cells appear to grow more three-dimensional, like they do in living tissues, when they are cultured in space."

Bioreactor cell growth in microgravity permits cultivation of tissue cultures of sizes and quantities not possible on Earth, allowing research in areas pertinent to human diseases, including cancer, diabetes, heart disease and AIDS. The Cellular Biotechnology Operations Support System is managed by Johnson Space Center in Houston, and is part of the Microgravity Research Program at Marshall — NASA's Lead Center for low-gravity research.

For more information on Expedition Three experiments, visit: <http://www1.msfc.nasa.gov/NEWS-ROOM/background/experiments.html> and <http://www.scipoc.com/factchron.html> - exp3fact

The writer, employed by ASRI, supports the Media Relations Department.



File photos

Rachel Kamenetzky, in foreground, and Miria Fincknor examine samples that are part of the MISSE experiment.



Photo by Emmett Given, NASA/Marshall Space Flight Center

Thanks for the support

Marshall Center Director Art Stephenson, left, presents Gina DeSimone, senior site executive for The Boeing Company in Huntsville, with a trophy for support of the For Inspiration and Recognition of Science and Technology (FIRST) Robotics Competition.

Marshall contractor one of 12 selected for Stokes Fellowship

by Debra Valine

Chanel Leslie, a university education coordinator in Marshall's Education Programs Department, employed by Ai Signal Research Inc., has been named one of 12 recipients of the Louis Stokes Professional Leadership Program fellowship.



Leslie

She is one of three from the Marshall Center selected for the fellowship. Leslie is being sponsored by the Marshall Center. Evett Turner, of the Johnson Space Center in Houston, and a former ASRI employee at Marshall, is being sponsored by Johnson. Pamala Heard, who worked at Marshall through the Inter-governmental Personnel Act, is being sponsored by Stennis Space Center in Mississippi.

At Marshall, Leslie coordinates minority education and outreach programs for the Equal Opportunity Office. She has a bachelor's degree in liberal studies/elementary education from Longwood College in Farmville, Va., and a master's in education from Alabama A&M University in Huntsville.

"I'm honored and excited to have been selected as one of only 12 recipients from across the country for this fellowship," Leslie said. "This is a wonderful opportunity for both personal and

professional growth."

The Louis Stokes program — named for former U.S. Rep. Louis Stokes of Ohio — was established in 2000 under a NASA cooperative agreement between the Office of Equal Opportunity Programs and the National Association for Equal Opportunity in Higher Education.

The purpose of the program is to strengthen the delivery, management and program outcomes of NASA-sponsored research and education programs at historically black colleges and universities and other minority institutions, including Hispanic service institutions and tribal colleges and universities.

The Stokes Program is a four-year professional development assignment for college administrators and educators. Under the cooperative agreement, NASA agreed to provide opportunities for NASA-specific training on NASA activities related to institutions of higher education and for on-site NASA developmental assignments. The on-site NASA development assignment is expected to occur during the first two years of the program. The last two years will occur in a development assignment at a historically black college or university or other minority institution. During the four-year program, the Stokes Fellows will participate in at least two non-NASA professional development training activities.

While serving 30 years in the U.S. House, Stokes took the lead on advancing issues relating to minority health and was a proponent of increasing the numbers of minorities in science and technology.

The writer, employed by ASRI, is the Marshall Star editor.

Marshall's co-op students treated to special luncheon

Co-op students working this summer with the Marshall Center, recently were treated to a special luncheon with Center Director Art Stephenson and Center Deputy Director Jim Kennedy.

Stephenson and Kennedy spoke on setting goals and choosing career paths.

Marshall's Co-op Program provides study-related experience for students

pursuing associate, baccalaureate and graduate curricula in subject matter fields useful to the Marshall Center. Students work a series of planned and alternating work assignments related to their academic study until they graduate with their degrees.

The students participating in the program this summer represent Louisiana State University, the University of

Alabama in Huntsville, Tennessee Technological University, the University of Alabama in Tuscaloosa, the University of Florida, Utah State, Clemson University, New Mexico State, Tennessee State, Auburn University, the University of Puerto Rico, Wallace State College, and the Georgia Institute of Technology.



Photo by Dennis Olive, NASA/Marshall Space Flight Center

Summer co-op students at Marshall are, from left, first row: Quy Nam Quan, Clemson University; Jonathan Lowe, Georgia Institute of Technology; Aimee Cole, Louisiana State University; Michelle Wright, University of Alabama in Huntsville; Kristin Medley, Tennessee Technological University; Zachery L. Butler, University of Alabama in Huntsville; Latoy Jones, Tennessee State University; Ruth Pegourie, University of Alabama in Huntsville; Samantha L. Estes, University of Alabama in Huntsville; Wendy Sullivan, University of Alabama in Huntsville; Jennifer Ickes, University of Alabama in Huntsville; ViJay Panjeti, University of Alabama in Huntsville; Ashley D. Erickson, University of Alabama – Tuscaloosa; Eileen Velez, University of Puerto Rico; Center Director Art Stephenson. Second row: Colie Georjan Warren, Auburn University; Kimberly R. Harrison, Auburn University; Brian Gibson, Tennessee Technological University; Adam Gowan, Tennessee Technological University; Ervin Ruben Hall III, University of Alabama in Huntsville; Steven Matthews, University of Alabama in Huntsville; Joel R. Hobbs, University of Alabama in Huntsville; Dustin Williams, Auburn University; Kimberly Harris, Tennessee State University; Victoria L. Hilty, Wallace State College; Michael Martin, University of Florida; Bryan Jennette, University of Alabama in Huntsville; and Chrissa Hall, co-op coordinator in Marshall's Employee and Organizational Development Department. April Huff, Wallace State College; Martin Jensen, Utah State University; and Koby South, New Mexico State University, are not pictured.

Remembering Sid



Sid Saucier
June 7, 1936 - Aug. 6, 2001

For some employees at the Marshall Center, Sid Saucier was the associate director. He was somebody from the ninth floor in Bldg. 4200 that you would see in the hall or elevator and exchange hellos with.

But for many employees, Sid Saucier was much more than that. He was mentor, leader and friend. He was a friend that will be missed very much.

Some of his close friends and associates share their memories and feelings for Sid Saucier, who died Aug. 6 following a nine-year battle with cancer.



Stephenson

Marshall Center Director Art Stephenson:

Sid was a member of our family for 39 years. During the last years, he suffered from a disease that weakened his body, but strengthened his soul. He carried himself humbly and made us all proud. Sid said the cancer that had invaded his body caused a transformation of his soul. He had found a relationship with God that transformed his relationships with people.



Sheila Cloud, director of Center Operations Directorate, left, and Saucier show "Why Mama Sang Bass" at the 1998 Marshall Retirees Dinner.

Sandy Such, executive support assistant:

Sid was a very courageous man. During the years Sid fought his own battle with cancer, my father was diagnosed with lymphoma. Sid counseled me and provided me with information and a list of herbs and vitamins that might help my father. Sid never complained about his illness or his treatments, and was always filled with determination to beat this disease.

Rex Geveden, manager, Microgravity Science and Applications Department:

He was a very demanding boss, and his natural inclination was to challenge everything you took to him. Consequently, you quickly learned to be very well prepared for any meetings with him. He was tough, but he always had the interests of the Center at heart. He also had a fun-loving side. He threw a big Halloween party every year in his Directorate and most of the employees wore costumes to work for the entire day. I especially enjoyed those Halloween parties because the Center had a very serious tone and very serious work, and it felt like a mild rebellion to participate.



Geveden

Patsy Fuller, executive assistant:

Sid was dedicated to the space program and provided strong leadership for our Center. I was privileged to work closely with him for the past five years and witness his daily courage and

Saucier

determination. Even in the most difficult times of his battle with cancer, he kept a positive spirit, didn't indulge in self-pity, and showed love and concern for others. He was an inspiration to those who knew him, and will be missed.

Bob Hughes, manager, Development Projects

Office: Sid was a true friend, a friend to the NASA that he believed in and a friend to the Marshall Center and the people he loved. Sid was a great mentor and helped much of the leadership that now runs the Marshall Center to develop their full potential. Sid had many setbacks in his life, but was a fighter of the toughest type. This toughness made him an example for never giving up, and his later years are a testament to his real character and nobility.



Hughes

Robin Henderson, deputy for management, Microgravity Research Program Office:

Sid was a wonderful mentor to me. He always took time to listen and give advice. He would tackle the hard job of pointing out areas where he felt I needed improvement, but he was also quick to praise what he found good and to reward a job or task that he thought was well done. He believed strongly in rewarding people for their efforts.



Henderson

Parker Counts, manager, Solid Rocket Booster Project

Office: Sid was the type manager who would not ask an employee to do something he would not also do. Sid was known to be very "aggressive" in his earlier life, but he had a unique way of coming back and smoothing things out.



Counts



Saucier, center, receives a proclamation signed by Huntsville Mayor Loretta Spencer for Asian/Pacific American Heritage Month from Alan Chow, left, and members of the committee.

Rose Allen, manager, Program Planning and Development

Office: I have many cherished memories of Sid. During March 1996, Sid received discouraging news that his condition had worsened and the treatment options were uncertain. Despite the feat and discouragement he was experiencing, he unselfishly reached out to comfort my husband and me while our youngest son was in the hospital fighting complications from a viral infection. This is just one example of the many ways his kindness touched my life.



Allen



Saucier, left, helps present the Combined Federal Campaign check to Harris Home for children. Also pictured are Rosa Kilpatrick, Roslin Hicks, Robert Richardson, Shar Hendrick and Melinda Seigler.

Student wins science fairs with help from Marshall scientist

by Debra Valine

Sometimes all it takes is a few kind words and a little guidance to encourage school children to reach for their goals. NASA employees are in a position to provide guidance to students interested in space, science, technology ... and the list goes on.

For the past two years Kate Pazamickas, a rising freshman at the St. Monica School in Sunbury, Pa., has been working on a space weather project with her middle school science teacher, Monica Shovlin.

Even with the two of them working together to make her project work, they were stymied. To get help, they turned to Dennis Gallagher at the Marshall Center.

"I don't get anything more than an assist," said Gallagher, a space physicist in Marshall's Science Directorate at the National Space Science and Technology Center. "Sure, I helped, but it was Katie who stubbornly persisted against the difficulties of performing her experiment. She succeeded beyond her wildest dreams."

Not only did her project win in school, regional and state science fairs, she has fostered an exceptional level of interest in science for other students and teachers.

To reward her for inspiring her fellow students and to encourage a "continued high" at St. Monica School, Pazamickas, her parents, brother and science teacher were invited to visit the Marshall Center.

"Students win the state science fair competitions in every

state of the union every year," Gallagher said. "What doesn't happen is for a whole school to get excited about one student's project."

Her project measured fluctuation in the Earth's magnetosphere using a 2-liter soda bottle magnetometer.

"She compared her measurements with NASA's measurement index," said Shovlin. "That is how Dennis (Gallagher) got involved." Pazamickas was a seventh-grader when she started the project.

"The measurements were pretty close," Pazamickas said. She found the project on a Web page, and had already taken on the soda bottle magnetometer experiment, but was having trouble. The Web page included a list of people to contact, including Gallagher. So, when she couldn't get it to work, she e-mailed for help, and Gallagher responded.

For her eighth-grade project, she expanded her project. "I measured how fast coronal mass ejections would travel between the Sun and Earth," said Pazamickas, whose measurements were almost exact.

"This experiment ties in with her seventh-grade project because the coronal mass ejections affect the magnetosphere," Shovlin added.

Gallagher, who has been with Marshall since 1984, said helping Kate with the project was worthwhile and also made him feel good.

"Many of us at Marshall — and certainly throughout NASA — often receive e-mail from students and the public," Gallagher

said. "Nearly all of these messages are earnest requests to understand something about nature or one of NASA's programs. It means people are curious and care to understand more about science and engineering."

At Marshall, Gallagher studies the space plasma environment near Earth. "I try to understand how energy and plasma are transported in near Earth space in response to energy input from the solar wind," Gallagher said.

"Sure, we're busy," he continued, "but you can't put a price on what you return to society when you're willing to listen and answer. A thoughtful reply will always make the day for a student or an adult, and may sometimes resonate with a whole community as Kate's project did. You can spark a fresh mind to later solve today's unsolvable problems, or you can snuff out their enthusiasm. Every NASA employee has that power with the public."

The writer, employed by ASRI, is the Marshall Star editor.



Photo by Dennis Olive, NASA/Marshall Space Flight Center

Dr. Fred Leslie, right, of Marshall's Science Directorate, shows Kate Pazamickas a tube containing liquid magnetic material during her recent visit to the Center.

NASA solar aircraft sets altitude record

NASA release

NASA's solar-powered, propeller-driven Helios aircraft set a new world record altitude of 96,500 feet on Monday, surpassing the old record for aircraft without rocket power by more than 10,000 feet. Sustained operations at that altitude promise to enable capabilities ranging from environmental monitoring to radically improved communications on Earth to simulating flight in the atmosphere of Mars.

NASA Administrator Dan Goldin, who has been a strong supporter of solar-powered flight, said, "This is a ground breaking accomplishment which will advance this technology to new heights."

The remotely piloted wing, built by AeroVironment, Inc., Monrovia, Calif., took off from the U.S. Navy's Pacific Missile Range Facility on the Hawaiian island of Kauai at 8:48 a.m. local time. Flying at about 25 miles an hour, the aircraft stayed aloft almost 17 hours, passing the old altitude records of 80,200 feet for propeller-driven aircraft and 85,068 feet for any aircraft not powered by rockets. Helios reached its highest altitude at 4:08 p.m. local time and landed at 1:43 a.m. Tuesday local time.

The record flight sets the stage for follow-on missions that will use a regenerative fuel system now under development to enable Helios to remain aloft 24 hours a day for months at a time. The aircraft reached record altitude during daylight hours, relying on solar cells on the wing's surface to provide electrical power. Descent after dark was possible, as the 14 electric motors were no longer needed to maintain altitude. During descent the propellers acted as generators, providing electrical power to control the aircraft.

Production variants of Helios might see service as long-term Earth environmental monitors or as communications relays, reducing dependence on satellites and providing service in areas not covered by satellites. The successful flight at high altitude also provides NASA with information about flight on Mars, since the atmosphere at that height above Earth replicates the atmosphere near the Martian surface.

There are no Safety Bowl questions in the Marshall Star this week. Be sure to see next week's issue for the last set of Safety Bowl questions and answers before the start of competitions.

Astronomers go behind Milky Way to solve X-ray mystery

Marshall release

Through layers of gas and dust that stretch for more than 30,000 light years, astronomers using NASA's Chandra X-ray Observatory have taken a long, hard look at the plane of the Milky Way galaxy and found that its X-ray glow comes from hot and diffuse gas. The findings, published in the Aug. 10 issue of Science, help to settle a long-standing mystery about the source of the X-ray emission from the galactic plane.

Scientists have debated whether the Milky Way plane's X-ray emission was diffuse light or from individual stars. Armed with Chandra, an international team led Dr. Ken Ebisawa of Goddard Space Flight Center in Greenbelt, Md., zoomed in on a tiny region of the galactic plane in the constellation Scutum.

The observation marks the deepest X-ray look at the so-called "zone of avoidance" — a region of space behind which no optical observation has ever been taken because thick dust and gas in the spiral arms of the Milky Way galaxy block out visible radiation. Infrared, radio and X-rays, however, can penetrate this dust and gas. Detection of diffuse X-rays emanating from the galactic plane, what we call the "Milky Way" in visible light, indicates the presence of plasma gas with temperatures of tens of millions of degrees Celsius.

Gas this hot would escape the gravitational confines of the Milky Way galaxy under normal circumstances. The fact that it still lingers within the galactic plane is the next mystery to solve. One possibility, suggested by Ebisawa is that hot plasma may be confined to the Milky Way by magnetic fields.

The Chandra observation, conducted in February 2000, lasted 28 hours. The team observed what was known to be a "blank" region of the galactic plane where the Japanese X-ray satellite ASCA had previously observed but found no individual X-ray sources.

For more information, visit the Web at:
<http://chandra.nasa.gov>

Obituaries

Carlile, Chalmus D., 77, of Huntsville, died July 30. He retired from Marshall in 1980 where he worked as an electronics technician. He is survived by his wife, Luz Edith Calvo Carlile.

Brooks, Charles G., 83, of Huntsville, died July 30. He retired from Marshall in 1971 where he worked as a management analyst.

Harris, Henry C., 76, of Madison, died Aug. 1. He retired from Marshall in 1974 where he worked as a quality assurance specialist. He is survived by his wife, Linda Harris.

Crumbley, William F., 73, of Rogersville, died Aug. 3. He retired from Marshall in 1984 where he worked as an AST in Data Analysis. He is survived by his wife, Mavis McGraw Crumbley.

James, Earl C., 71, of Hartselle, died Aug. 3. He retired from Marshall in 1986 where he worked as a research lab mechanic. He is survived by his wife, Reba Williams James.

Proper precautions help prevent back injuries

Editor's note: The following safety/health information is a refresher for awareness, and is in no way to be used as a substitute for job training or proper equipment use.

Your backbone is made up of 24 individual bones called vertebrae that are stacked on top of one another. Your vertebrae are separated by soft discs of cartilage that perform as shock absorbers for your vertebrae and also help your back to bend, twist and move around. Most of the support to your spine is maintained by your stomach muscles, as well as the many muscles and ligaments that run up and down the length of your back.

Prevention is the best medicine

Preventing a back injury is much easier than repairing one. Because your back is critically important to your ability to walk, sit, stand and run, it's important to take care of it. Most back pain arises from using your back improperly, so learning a few basic rules about lifting, posture and proper exercise can help keep your back in good shape.

Exercise to strengthen your back and reduce stress

Having strong back and stomach muscles is important to ease the work your back is put through each day. By doing simple back-toning exercises, you not only strengthen your back, but also reduce stress and improve your appearance, too. Check with your doctor (or the Exchange exercise personnel) as to the best exercises for you.

Lose weight

Pot bellies and being overweight exerts extra force on back and stomach muscles. Your back tries to support the weight out in front by swaying backwards causing excess strain on the lower back muscles. By losing weight, you can reduce strain and pain in your back.

Check with your doctor (or the Exchange exercise personnel) for the most sensible diet plan for you.

Maintain good posture

You can prevent many back pains by learning to sit, stand and lift items correctly. When you sit down, don't slouch. Slouching makes the back ligaments, not the muscles, stretch and hurt, thus putting pressure on the vertebrae. The best way to sit is straight, with your back against the back of the chair with your feet flat on the floor and your knees slightly higher than your hips. Learn to stand tall with your head up and shoulders back.

Maintain good posture while you sleep and drive

Sleep on a firm mattress or place plywood between your box springs and mattress for good back support. If your mattress is too soft it could result in a back sprain or sway back. Sleep on your side with your knees bent or on your back with a pillow under your knees for support. Drive with your back straight against the seat and close enough to the wheel so your knees are bent and are slightly higher than your hips.

Plan your lift

Lifting objects is often a mindless task, and unfortunately, many people perform their lift incorrectly resulting in unnecessary strain on their back and surrounding muscles. To lift correctly and reduce strain on your back, it's important to plan your lift in advance. This means to think about the weight of the object you will be moving and the distance you will be moving it. Is it bulky? Will you need help? Do you see any hazards that can be eliminated? Think about this whenever you do any lifting.

Position yourself correctly in front of the load

Once you have planned your lift, the next important step is to align yourself

correctly in front of the load with your feet straddling the load - one foot slightly in front of the other for balance. Slowly squat down by bending your knees, not your back and stomach. Using both hands, firmly grab the load and bring it as close to your body as you can. This will help distribute the weight of the load over your feet and make the move easier.

Lift with your legs, not your back

Once the load is close to your body, slowly straighten your legs until you are standing upright. Make sure the load isn't blocking your vision as you begin to walk slowly to your destination. If you need to turn to the side, turn by moving your feet around and not by twisting at your stomach.

Set the load down correctly

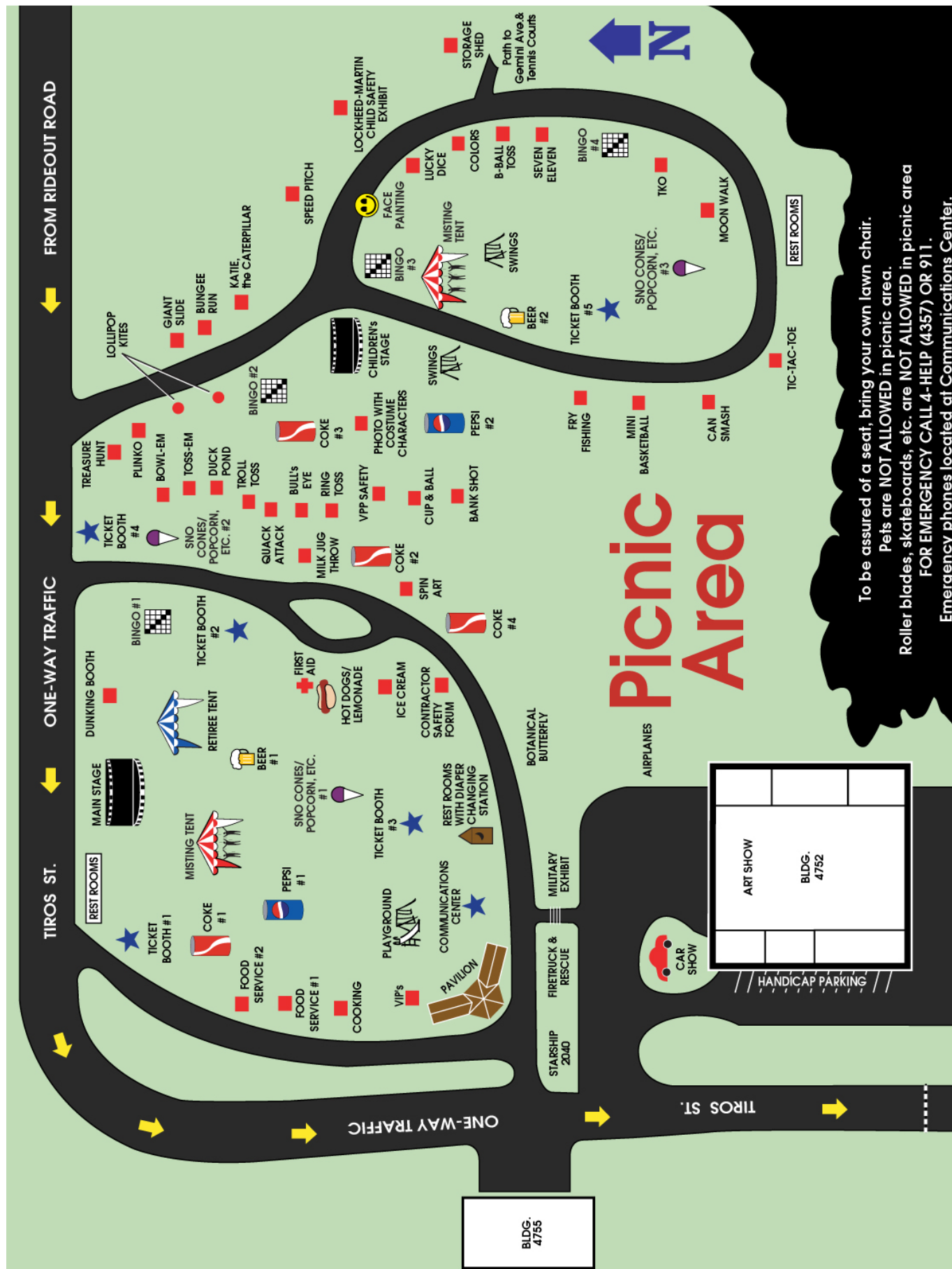
Once you have reached your destination, it's equally important that the load is set down correctly. By reversing the above lifting procedures you can reduce the strain on your back and stomach muscles. If you set your load on the ground, squat down by bending your knees and position the load out in front of you. If the load is set down at table height, set the load down slowly and maintain your contact with it until you are sure the load is secure and will not fall when you leave.

Get help, if needed

If the load is too heavy, bulky or awkward for you to lift alone, find a friend to help you carry it. If no one is available, is it possible to break the load into two smaller loads? Or, can you locate a cart or dolly to help you move it? Look for simple solutions to help make the move easier on you and your back.

The fitness personnel at the NASA Exchange offer back injury prevention instruction. Just call Pat Mirandy at 544-7570 and arrange a time for you and your co-workers to receive this training.

Picnic area takes on new look for Family Fun Day 10 a.m.-3 p.m. Aug. 25



Sports

Men's tennis tournament

The MARS Tennis Club's August Men's Tournament Aug. 18 has been canceled. The next tournament will be a closed HI-LO on Sept. 8. To participate, call Ronda Moyers at 544-6809 or send and e-mail to: ronda.moyers@msfc.nasa.gov

Bowling league

The MARS Bowling League will hold an organizational meeting at 6 p.m. Aug. 21 at Monarch Lanes at 2009 Bob Wallace Ave. in Huntsville. Team captains or a member of each team should attend. The league will begin at 6 p.m. Sept. 4. Marshall employees, retirees, contractors and family members may join. For more information, call Chuck Seal at 544-1120 or Rob Lake at 544-1176.

Rec Center Tours

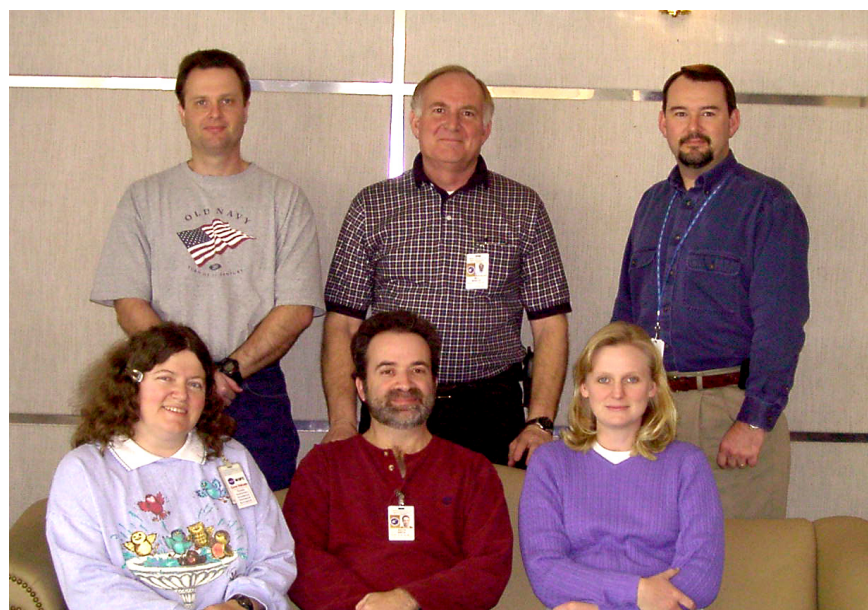
Sept. 8: Take a tour to see "Eternal Egypt" at the Pyramid in Memphis, Tenn. Cost is \$35. The tour departs the Recreation Center at 6 a.m. and returns at 10 p.m. This extraordinary exhibit of treasures and artifacts is presented in cooperation with the British Museum. The audio narration by Omar Sharif will transport you to another time and place and envelope you in the mystery of Egypt. This exhibit is part of the Wonders Series.

Sept. 22: Shop at The Factory in Franklin, Tenn. All seats are \$12. The tour departs at 8 a.m. and returns at 5 p.m. The Factory was once a Magic Chef stove factory, now it's a group of specialty, import, gourmet and antique shops.

For more information, call Wednesday through Friday from 1:30-8 p.m. or Saturday and Sunday from 10 a.m. until 6 p.m. at 876-4531. The Recreation Center is located on the corner of Patton and Aerobee near the Fitness Center and the Redstone Lanes.



The Division I winning team, KAOS. From left, first row: Karen Oliver, Bridget Kietz and Alys Blair. Second row: Linda Clark, David Hathaway, Bill Witherow, Kurt Dietz, Dennis Gallagher and John Busbey.



The Division II winning team, Warriors. From left, first row: Linda Brewster, Keith Smith and Ginger Demirjian. Second row: David O'Dell, Bill Boglio and Steve Wright.

Let's play volleyball

The MARS Volleyball Club is looking for players. The season begins in late August and ends by Thanksgiving. Teams play once or twice each week starting at 5 p.m. All play is indoors. Tournament play is divided into two divisions, with Division I having the most experienced players. All NASA civil servants, contractors and family members are eligible to participate.

The first organizational meeting will be at noon Aug. 23, Bldg. 4752, all-purpose room. For more information, call Dennis Gallagher at 961-7687.

Center Announcements

Blood drive

The American Red Cross is holding a blood drive from 8 a.m.-1:30 p.m. Friday at Bldg. 4752. All blood types are urgently needed. Anyone who cannot attend this blood drive, but wishes to participate, can donate at 1101 Washington St., Monday through Thursday from 10 a.m.-5:30 p.m. or Friday from 8 a.m.-1 p.m. Those who last names begin with A-B are asked to donate between 8-8:30 a.m.; C-F, 8:30-9 a.m.; G-H, 9-9:30 a.m.; I-L, 9:30-10 a.m.; M-P, 10-10:30 a.m.; Q-S, 10:30-11 a.m.; and T-Z, 11-11:30 a.m.

Online employee benefits

The new NASA Employee Benefits Statement will soon be available online at: <http://benefitstatement.nasa.gov>. It will provide information about federal employees' health benefits, group life insurance, worker's compensation, leave balances, and a retirement and disability estimate. For more information, call Edwina Bressette at 544-8115. Individual pin numbers allowing access to the Web site will be issued via internal mail.

Access 'ASK Magazine' online

Ask Magazine, an e-publication oriented toward aerospace project management is available online at: http://www.appl.nasa.gov/knowledge/ask_home.htm. The most recent issue focuses on program reviews and how good managers have learned from them to the benefit of their projects.

Upcoming Classes

Listening, coping workshops

Two workshops will be held Sept. 11 in Bldg. 4200, room G-13C. Coping with tough times will be from 8-11 a.m. Improve on-the-job listening and speaking skills will be from noon-3 p.m. Civil servants may register through AdminSTAR.

Women in Management seminar

A live seminar, "Breaking the Glass Ceiling — Real Women, Real Issues," will be broadcast from 11:30 a.m.-1:30 p.m. Aug. 24 on Marshall's Continual Learning Channel 14. To register for this seminar and receive materials, e-mail the name of the seminar, your full name and phone number to: edtec@msfc.nasa.gov

SLaTS Symposium

The Space Launch and Transportation Systems (SLaTS) Design and Operations Book Symposium will be Sept. 5-6 at Technology Hall, room S105, University of Alabama in Huntsville. Cost is \$75; or \$20 for full-time students and retirees. Make checks payable to AIAA AL-MS Section, P.O. Box 7208, Huntsville, AL 35807. For more information, call Arloe Mayne at (256) 881-7124.

Clubs and Meetings

Shuttle Buddies meet

The Shuttle Buddies will meet for breakfast at 9 a.m. Aug. 27 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.

Genealogy society meets

The Huntsville Genealogical Computing Society will meet at 7 p.m. Aug. 20 in the auditorium of the Huntsville-Madison County Public Library. The program is on researching genealogy online and using family archive CDs.

Association scholarships

The Marshall Association is accepting applications for college/university scholarships through Aug. 24. Two scholarships — one technical, one non-technical — will be awarded to incoming freshmen in September 2001. For more information, call Efreem Hanson at 544-6340.

Dance lessons

Dance lessons will resume in September. Fox Trot and Tango lessons will be taught the first four Mondays after the Labor Day weekend — Sept. 10, 17, 24, and Oct. 1 — at Saint Stephens Episcopal Church on Whitesburg Drive, second building north of Lily Flagg Road. Intermediate lessons will be from 7-8 p.m., and beginners from 8-9 p.m. Rick Jones of the Rocket City Dance Studio since 1993, and certified by the National Dance Council of America, will be the instructor. Cost is \$6 per person per class. For more information, call Woody Bombara at 650-0200.

NASA Exchange

Discount men's wear

NASA employees, retirees and contractors can receive a 10 percent discount on the purchase of regular-priced merchandise at Men's Wearhouse. Free lifetime pressing, free re-alterations of any seams previously altered, and 24-hour turnaround on tailoring (by request) are available without additional charge. To receive the discount, just show your NASA badge or VIP Corporate Member card, which is available in limited quantities in the NASA Space Shop, Bldg. 4203. For details, call 544-7565.

Book fair

NASA employees, retirees and on-site contractors are invited to take advantage of the book fair sponsored by the NASA Exchange from 9 a.m.-4 p.m. Aug. 21-23, in the lobby of Bldg. 4203. A wide selection of books will be offered at special discounted prices.

Employee Ads

Miscellaneous

- ★ Designer's board, 10"x12", has T-square, angles, \$3.50; small hydraulic jack, \$8.50; cellular phone, \$40. 881-8648
- ★ Viola w/case, bow, rosin, music, \$200 obo. 534-8186
- ★ Sears microwave oven, 1.5 cu. ft., \$45. 881-6040
- ★ Color TV, 19", cable ready w/remote, about 10 yrs. old, works, \$30. 658-2471
- ★ Black metal desk, size 24x60, two file and two storage drawers, \$55. 881-9084
- ★ Craftsman Eager 3.5HP walk-behind edger/trimmer, garage kept, \$225 obo. 859-6952/leave message
- ★ Snapper riding lawn mower w/bagger and utility trailer, 9HP, 28" HI/VAC mulching blade, 2 yrs. old, \$800. 353-0370 after 5 p.m.
- ★ Aluminum camper shell for full-size pickup truck, \$150. 778-9149/Dave
- ★ 1987 Suzuki Savage LS650, new paint, 9,400 miles, \$800. 961-1136/205-429-3805
- ★ Ping 13, 3-wood, steel shaft, 3-months old, \$115. 828-6247
- ★ Craftsman garden tractor, 12HP, \$375; Murray tractor, 12HP, 5-speed, \$375. 652-1495/707-6544
- ★ Armour 845 irons, 3-PW, shortened 2" for junior, 2 yrs. old, \$200. 230-0762
- ★ Clarinet, wood, \$125. 882-7084
- ★ Old Town Discovery 158 canoe w/2 paddles, \$600. 881-0533
- ★ Antique Duncan-Fyfe sofa, \$190; matching mahogany coffee table, \$75; young child's rocking horse, \$25; dresser w/mirror, \$125. 881-8674
- ★ Marriott coupons, \$200. 355-6116
- ★ Computer, 386SX, color monitor, \$35; color TV, 11", white, \$35. 830-1905
- ★ 350 mhz P-II complete computer system, w/monitor, printer, and speakers, 128 mg ram, cd-rw and more, \$450 obo. 837-3234
- ★ Toyota factory steel wheels w/tires, fit 4x4 truck or 4Runner, 6-lug, \$60. 837-1405
- ★ Nordic Track walker, \$125. 230-0762
- ★ Pentium II, 200 MHz system w/32Mb RAM, 17" monitor, 2 Gb HD, \$250 obo.

Metal 5-drawer file cabinet, \$35. 882-1779

Vehicles

- ★ 1996 Saturn, SC2, red w/tan interior, 5-speed, all-power, CD, new clutch, brakes, tires, plugs & wires, 67K miles, \$7,500. 533-4657
- ★ 2001 SL2 Saturn, 20K miles, gold, automatic, keyless entry, \$12,500. 355-6171
- ★ 1995 Rio Grande Jeep, red, 50K miles, soft top, speed a/c, one-owner, \$8,000. 301-1665
- ★ 1991 Jeep Wrangler, Islander package, blue, gray soft top, automatic, CD player, 110K miles. 256-778-8562
- ★ 1990 Chrysler Lebaron convertible, 100K miles, \$3,500 obo. 883-7752 after 5 p.m.
- ★ 1994 Ford F150, V-8, 5-speed, 118K miles, short bed, a/c, dual tanks, CD, stripes, \$5,450. 256-753-2278
- ★ 2000 Acura Integra, auto, air, cruise, all-power, CD, spoiler, 17.5K miles, \$16,999. 534-6071
- ★ 1993 Dodge Grand Caravan SE, one-owner, many new parts, service records available, \$4,600 obo. 895-9520
- ★ 1989 Jeep Cherokee Pioneer, red, 4-door, 4WD, a/c, AM/FM cassette, 144K miles, \$4,000. 539-5886
- ★ 1991 Honda Accord, silver, automatic, 213K miles, \$3,000. 355-8600
- ★ 1990 Ford Probe GT, 5-speed, chrome wheels, new tires/parts, service records, 144K miles, \$2,950. 883-2125
- ★ 1990 Honda Accord LX, 2-door, 5-speed, a/c, power windows/locks, cruise, AM/FM cassette, 124K miles, \$4,200. 859-0729

Free

- ★ Metal swing sets, three each, you haul away. 534-8186

Wanted

- ★ Tandy 4016 SX computer with setup diskettes. 461-8228
- ★ Dependable vehicle, desperate need of transportation, small deposit down w/very

low monthly payments. 721-7835

- ★ 1977-1979 Ford F150, 4x4, truck; 77-79 Ranger XLT; 1960-1967 Ford Fairlane or Mercury Comet; 1971-1972 Ford F100 pickup; good condition. (256) 426-8218

Job Opportunities

SES Vacancies:

Vacancy Announcement Number:

MSFC-ES-01-01, Deputy Director, Engineering Directorate, George C. Marshall Space Flight Center. Closes Sept. 11.

Vacancy Announcement Number:

MSFC-ES-02-01, Deputy Director, Flight Projects Directorate, George C. Marshall Space Flight Center. Closes Sept. 11.

CPP-01-079-KP, Program Analyst, GS-343-13, Science Directorate, Business Management Office. Closes Aug. 21.

CPP-01-080-JB, AST, Fluid Mechanics, GS-861-14, Space Transportation Directorate, Subsystem and Component Development Department, Fluid Physics and Dynamic Group. Closes Aug. 27.

CPP-01-089-JB, AST, Aerospace Flight Systems, GS-861-14, Space Transportation Directorate, Advanced Concepts Department. Closes Aug. 27.

CPP-01-049-DS, AST, Technical Management, GS-801-13/14, Customer and Employee Relations Directorate, Technology Transfer Department. Closes Aug. 28.

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